REMARKS

The comments of the applicant below are each preceded by related comments of the examiner (in small, bold type).

Claim(s) 1-41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 1, 12, 21, 32 and 41 merely manipulates data or an abstract idea, or merely solves a mathematical problem without a limitation to a practical application. A practical application exists if the result of the claimed invention is "useful, concrete and tangible" (with the emphasis on "result")(Guidelines, section IV.C.2.b). A "useful" result is one that satisfies the utility requirement of section 101, a "concrete" result is one that is "repeatable" or 'predictable", and a "tangible" result is one that is "real', or "real-world", as opposed to "abstract" (Guidelines, section IV.C.2.b)).

In order to for the claimed product to produce a "useful, concrete and tangible" result, recitation of one or more of the following elements is suggested:

*   **The manipulation of data that represents a physical object or activity transformed from outside the computer.**

*   **A physical transformations outside the computer, for example in the form of pre or post computer processing activity.**

*   **A direct recitation of a practical application;**

Applicant is also advised to provide a written explanation of how and why the claimed invention (either as currently recited or as amended) produces a useful, concrete and tangible result.

Claims 2-11, 13-20, 22-31 and 33-40 are rejected by the virtue of their dependency.

The applicant respectfully disagrees with and does not concede the examiner's position. Claims 1, 12, 21, 32 and 41 have been amended to recite "produc[ing] a reflectance image for the sequence of images." The result of the method of claim 1 is a reflectance image. Under the Guidelines of section IV.C.2.b of the Official Gazette notice, the reflectance image is "useful" for "representing and analyzing sequences of images of a natural scene" (page 1, lines 7-11), "concrete" because the resulting reflectance image is "repeatable" and "predictable," and "tangible" because the reflectance image is a "real-world" result.

Claim(s) 21 and 32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. The specification, at page 17 defines the claimed information carrier as encompassing statutory media such as a "machine readable storage device", as well as non-statutory subject mater such as a "propagated signal"

A "propagated signal" embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Claims 22-31 and 33-40 are rejected by the virtue of their dependency.

The applicant respectfully disagrees with and does not concede the examiner's position. However, to expedite prosecution, the applicant has amended claims 21 and 32 to recite a computer program product embodied on "a computer readable medium."

3.   Claims 2, 5, 13, 22,25 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4.   Regarding claims 2, 13, 22, and 33 the phrase "such that" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

5.   Claim 2, 13, 22, and 33 recites the limitation "the product" in line 3. There is insufficient antecedent basis for this limitation in the claim.

6.   Claim 5 and 25 recites the limitation "the luminance" in line 3. There is insufficient antecedent basis for this limitation in the claim.

The amendments have been made.

8. Claims 1, 12, 21, 32 and 41 as best understood are rejected under 35 U.S.C. 102(b) as being anticipated by Deriving intrinsic images from images sequences, by Weiss.

With respect to claim 1 as best understood, Weiss discloses transforming images in a Jog opponent, (see page 2, section 2 lines 1-5, work is done in log domain); applying a plurality of filters to the images the derivative are in two different directions, (see page 3, col. 1, paragraph 2 and page 4, col. 1, lines 3-10 the vertical and horizontal filters); calculating a median of the images, (see page 3, col. 1, the equation 2); using the median images calculate the reflectance, (see pages 3-4 fro the entire calculations) as claimed.

Claims 12, 21, 32 and 41 as best understood are rejected for the same reasons as set forth in the rejection of claim 1.

The applicant respectfully disagrees.

Claims 1, 21 and 41 recite transforming images in a sequence of images into a "log opponent color domain." For example, in one implementation described in the application, images in a sequence of images are transformed into the log opponent color domain from the sRGB domain using equations (9)-(11). (page 9, line 16, to page 10, line 10) There are several advantages to using an opponent color domain. In this regard, the specification states:

> The use of an opponent color space can be advantageous for several reasons. First, typically within a single image changes in the luminance channel delineate objects from one another more than changes in the chrominance channels. Second, as the illumination on an object changes from one image to another within the sequence of images, the color values of that object change less than the luminance value changes. Third, many image capture devices encode the chrominance channels at a lower resolution than the luminance channel. Therefore, a large class of image sequences can be expected to exhibit relatively lower chrominance bandwidth, resulting in filter outputs 310, 320, 330 in the chrominance channels that are sparser than filter outputs 340, 350, 360 produced in other color spaces. (page 8, lines 20-29)

Weiss describes simply transforming images in a sequence of images into the "log domain." (page 2, section 2, line 1) Accordingly, the Weiss algorithm calculates the logarithm of the reflectance image, $r(x,y)$, and the illumination images, $l(x,y,t)$, using the expression $i(x,y,t) = r(x,y) + l(x,y,t)$. (page 2, section 2, lines 1-5) Nothing in Weiss describes or would have made obvious transforming images in a sequence of images into the "log opponent color domain."

Claims 12 and 32 have been amended. Support for the amendment can be found in the specification, for example, in page 10, line 27, to page 11, line 3, and page 11, lines 21-25. Amended claims 12 and 32 recite applying a "plurality of filters spanning a frequency space" to the transformed images in the sequence of images. In Weiss, only a horizontal derivative filter and a vertical derivative filter are applied to the transformed images in the sequence of images. (page 4, paragraph 2 and Fig. 4) As stated in Weiss:

> All the results shown in this paper used just two filters: horizontal and vertical derivative filters. (page 5, section 3, lines 1-2)

In contrast, the application describes applying a "plurality of filters with "bandpasses that cover a larger portion of frequency space" to the transformed images in the sequence of images. (page 10, lines 27, to page 11 line 5) Further, the application states:

> Although using horizontal and vertical derivative filters is complete in the sense that they form a full basis for image space and high frequencies are well reconstructed, these filters' sensitivity to low frequencies is relatively small. This leads to objectionable low frequency errors in the background. This change in sensitivity results in a frequency dependent bias in how errors are weighted in the least squares solution given by $\hat{r} = g * \left(\sum_n f_n^* * r_n \right)$, high frequency errors receiving more weight than low frequency errors.

> This frequency bias can by reduced by employing a collection of filters that includes derivative filters applied in a plurality of directions *and/or sparse filters with bandpasses that cover a larger portion of frequency space.* In image 450, where the collection of filters has been applied, low frequency errors are reduced at a relatively small cost in high frequency reproduction. The application of the collection of filters causes illumination changes to be discounted and the final solution to be smoother than when only the high-frequency horizontal and vertical derivative filters are applied. (emphasis added) (page 10, line 21 to page 11, line 5)

Nothing in Weiss describes or would have made obvious applying a "plurality of filters spanning a frequency space" to the transformed images in the sequence of images.

All of the dependent claims are patentable for at least similar reasons as those for the claims on which they depend are patentable.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Enclosed is a Petition for One Month Extension of Time. The extension fees in the amount of $120, and excess claim fees in the amount of $100, are being paid concurrently on the
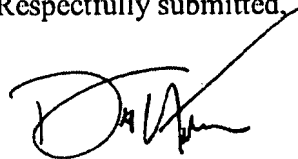
Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

Date: 8|6|7

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